

2.1 INTRODUCTION

Chapter 2 presents the physical characteristics of the Delta and its recreational boating-related facilities. The contextual information outlines the physical character and uniqueness of the greater Delta resource. This study builds upon the 1997 recreation analysis performed by California Department of Parks and Recreation in the *Sacramento-San Joaquin Delta Recreation Survey*. A brief description of Delta facilities is provided within the context of their geographic setting. In order to maintain consistency throughout the study, subsequent information about recreation and baseline conditions reference the physical characteristics of the Delta as defined in this chapter.

2.2 DELTA SETTING OVERVIEW

Six Delta recreation zones were previously defined in the cited *Sacramento-San Joaquin Delta Recreation Survey*. The recreational zones depict the Delta subdivided into six areas for the purpose of achieving a greater degree of specificity about recreational uses and areas of recreational activities. The zones are distinct in character, size, and location. They help provide a context for evaluating the survey, workshop, and analytical data that follow in subsequent chapters.

An important characteristic of the Delta is that it serves many purposes. Currently there are various strategic and physical planning efforts aimed at ensuring a viable future for the many critical functions that the Delta accommodates. One of the key planning efforts – the CALFED Bay-Delta Program, and the associated programs and actions – is described in **Chapter 7** of this study.

This study is built on the assertion that recreation is an important function of the Delta because it is an integral part of the history and existing character of the region. Also, there is an extensive community of enthusiasts who consider the Delta their special place, as the Delta serves as a popular venue for many types of water-related recreational activities that are supported by a longstanding

tradition of local recreation-oriented businesses and services.

GEOGRAPHIC AND LEGAL DESCRIPTION OF STUDY AREA

The Delta is located at the confluence of the Sacramento and San Joaquin Rivers, the largest estuary system on the West Coast. The estuary system functions as the hub of an extensive network of waterways that flow through the north and central regions of California. This aquatic system is the conduit through which runoff from over 40 percent of the State's land area flows into the San Francisco Bay and ultimately to the Pacific Ocean. Major tributaries that converge in the Delta include the Calaveras, Cosumnes, Mokelumne, Sacramento, and San Joaquin Rivers. Other rivers that add to the Delta drainage include the American, Yuba, Rubicon, Tuolumne, Merced, Feather, Pitt, and Shasta Rivers. Although the Delta is essentially a freshwater system, because of its relatively low elevations, water levels and flow velocities are subject to tidal influence.

The Delta was formally defined in 1959 with the passage of the Delta Protection Act (Section 12220 of the California Water Code). This act identified the statutory boundary and further defined the Delta Service Areas: areas irrigated from nearby Delta channels. The Legal Delta is also divided into two functional zones:

- The Upland Zone – lands above the five-foot elevation contour
- The Lowlands Zone – lands at or below the five-foot contour line

The Delta region encompasses approximately 738,000 acres, which is equivalent to 295,200 hectares or 1,150 square miles. Of those 738 thousand acres, there are approximately 60,000 acres of waterways with about 57,238 of those acres actually navigable. That water surface area provides approximately 635 miles of linear channels. This major water confluence supplies drinking water for two-thirds of the California population and irrigation water for over seven million acres of agriculture.

Much of the land area of the Delta is presently intensively managed for agriculture. The creation of agricultural lands within a tidal flood plain was the result of actions taken in the early 1850's and was initiated with the passage of the Federal Swamp and Overflow Act. A system of levees was constructed that channelized water flow and defined a labyrinth of islands between the water channels. Importantly, the character of the Delta was also radically transformed at this time from perhaps the largest wetland outside of the Florida Everglades to the predominantly tamed and productive agricultural land it is today. Hundreds of miles of navigable waterways resulted from this levee system. Many of these waterways follow the alignments of natural stream courses while others have been created for specific purposes, including navigational routes and directing water flows and water distribution. A significant portion of the created land area is now below sea level. Consequently, these lands are dependent on the more than 1000 miles of constructed levees that protect them from flooding.

SETTING

Generally, the Delta is rural in character with a feeling of remoteness, although it is actually situated within a relatively short driving distance from the San Francisco Bay Area and Central Valley communities. As shown in **Figure 2-1**, the Delta region adjoins the cities of Sacramento and West Sacramento to the north; Elk Grove and Galt to the east; Woodbridge, Morada, Lodi, French Camp, Lathrop, and Stockton to the southeast; Tracy and Mountain House to the south; and Oakley, Byron, Brentwood, Antioch, and Pittsburg to the west. The Delta is in close proximity to the cities of Davis, Dixon, Vacaville, Fairfield, and Suisun City to the northwest. It is populated with agricultural and recreation-oriented communities, including Bethel Island, Rio Vista, Isleton, Freeport, Courtland, Hood, Walnut Grove, Locke, and Discovery Bay. Of these communities, only Rio Vista is incorporated. From the typical visitor's perspective, a peculiar duality occurs within and around the Delta. Because of the flat topography and the predominant levee landform that generally defines both land-side and waterside views, land and water vistas tend to remain segregated. A boating trip through the Delta rarely allows generous views to the adjoining agricultural lands. Conversely, a drive through the

Delta may offer only a few glimpses of the nearby aquatic environment. The effect of this peculiar topography is that one does not really experience the whole Delta, regardless of the mode of travel or the length of time spent there.

2.3 RECREATION BACKGROUND

The Delta is a magnet for a variety of public recreational uses, including boating, fishing, camping, sailing, hunting, windsurfing, and water-skiing. As of the year 2000, it accommodated approximately 6.5 million user days per year. Because of its size and geographic position as the outflow and upper tidal zone to an extensive natural drainage area, it offers a unique freshwater recreation opportunity. Unlike the majority of the state's reservoirs, which are subject to drought and fluctuating water levels, the Delta provides a consistency in terms of water levels through dry and wet years with dependability for water-oriented recreation use year after year. An important consequence of reduced water levels is the reduction in actual surface area available for water recreation uses. During the drought years of 1976-77 and 1987-92, while other reservoirs were severely depleted, the Delta offered the same recreation opportunities as in non-drought years.

With miles of channels and connecting sloughs to navigate and explore, the extensive and intricate configuration of navigable waterways offers a unique boating experience. Additionally, the historic role of the Delta as an effective means of travel from point to point is still a viable and important feature. The Delta is a travel corridor to and from the Bay Area and upper Central Valley, as well as a means for travel between the adjoining communities within and around the Delta. The linear arrangement of the many channels offers road-like qualities with unimpeded accessibility. In the 1800's, the fastest and most direct means of travel between Sacramento and San Francisco was by ferryboat through the Delta. The Delta is also less restrictive than many of the other state reservoirs and bodies of water in terms of types of water crafts permitted, number of boat users (all classes) allowed on any given day, and types of engines or fuel systems allowed.

Because of the Delta's geographic relationship to the Bay Area and several nearby population hubs as described above, the Delta is readily accessible

to a large population through both boat-in access and land-based access from multiple launch sites scattered throughout the Delta.

The Delta also offers a diversity of settings, water depths, microclimates, and physical resources, thereby attracting a wide variety of recreation enthusiasts to its waters. For example, the Delta waters have historically been associated with an abundance and diversity of sports fish species that attracts several distinct angler groups. Other recreation enthusiasts are attracted to calm quiet waters found in areas such as the lee-side Diablo Range and still others are attracted to the unique wind conditions that occur in the windward areas such as the confluence of the San Joaquin and Sacramento Rivers. Seasonal and tidal wetlands, along with agricultural fields, attract a significant share of the Pacific Flyway's seasonal migration of waterfowl. Along with the 95 marinas found throughout the Delta, there are both public and private camping venues that serve as overnight destinations that enable extended stay opportunities. Other more intangible attributes include the unfettered and off-the-beaten-track qualities that allow unique experiences for its visitors.

Another attractive aspect of the Delta region is its historical legacy, which is linked to both the Gold Rush era and the early agricultural development period of the state. California as a whole has been radically transformed through multiple waves of growth and development, leaving few remnants behind. The Delta region still retains a number of elements associated with the state's early history that are offered in unpretentious settings.

2.4 RECREATION ZONES

This study has adopted the general boundaries defined in the 1997 *Sacramento-San Joaquin Delta Recreation Survey* conducted and produced by the California Department of Parks and Recreation, identifying Zone A through Zone F. The geographic areas are organized from north to south and subdivide the Delta into the following geographic areas:

- North Zone – (Zone A)
- Northwest Zone – (Zone B)

- Central Zone – (Zone C)
- West Zone – (Zone D)
- East Zone – (Zone E)
- South Zone – (Zone F)

For the purpose of clarity and easy reference, this report has assigned a geographic name for each zone roughly corresponding to the geographic relationship between the Delta zones. Consequently, Zone A is designated in this report as the North Zone, as it is the most northern of the defined zones, and Zone B is described as the Northwest Zone, etc. The six Delta zones are shown in **Figure 2-2**. It is important to note that the six primary zones vary greatly in terms of the quality and character of the resource, their relative size, the number of existing navigable waterways, the number of facilities, and the number of expected users.

Table 2-1 provides a quick statistical overview of the zones and the differences between each zone area. Most significant for this study are the relative amount of water surface area by zone and the varying number of recreational boat serving facilities. Although the geographical areas are approximately the same size among the six Delta recreation zones, the distribution of navigable water surface area is disproportional. Navigable waterways are defined as waterways that are a part of, or physically connected to, primary water channels, rivers, and canals and do not include isolated or cut-off (noncontiguous) water areas such as ponds, reservoirs, or lakes. Of a total estimated 57,576 acres of navigable waterways occurring throughout the Delta, approximately 5 percent are in the North Zone, 12 percent in the Northwest Zone, 10 percent in the Central Zone, 51 percent in the West Zone, 12 percent in the East Zone, and 10 percent in the South Zone.

Although these comparative numbers are useful in providing a sense of relative size and area of the different recreation zones, the numbers are somewhat misleading with respect to actual or potential water recreation usage. The Northwest Zone has nearly three times the water surface area of the North Zone. However, the majority of the water surface in the Northwest Zone is concentrated along the southern edge of the zone.

The canals and channels that do extend to the north tend to be seasonal, shallow, and vegetation-clogged. One exception is the Deep Water Canal. However, the Canal is now permanently blocked at the northern end by the William B. Stone Lock, which is no longer operated.

The North Zone, in contrast, is much smaller in terms of actual water surface. The waterways in the North Zone, including the Sacramento River, are major channels that not only extend throughout the zone, but also provide linkage beyond the North Zone to upstream destinations. The West Zone, with over 50 percent of the entire navigable water area of the Delta, is the water recreation hub of the Delta. The South Zone is exceptional because many of the waterways occurring in this part of the Delta have been impacted by the regulated water flows associated with the primary intake facilities near Clifton Court Forebay. The South Zone has also been impacted by upstream flood control projects, which have reduced the extent of storm water flushing that historically occurred during peak winter flows throughout the Delta. The result of these water flow interventions is the constriction by debris and siltation of many

of the once navigable channels such as portions of Old River, Middle River, and Trapper Slough.

Another water surface area anomaly that is important to note is the inundated islands that have now become part of the total water surface area of the Delta. Franks Tract, Little Franks Tract, Little Sherman, and Mildred and Liberty Islands are examples of inundated islands found in the Delta. Approximately 22 square miles of island area have been permanently converted back to aquatic or seasonally aquatic areas. These inundated island areas tend to be shallow and are prone to aquatic vegetation accumulation. Consequently, they are generally not conducive to multi-class boating use.

**Table 2-1
Summary of Facilities and Resources by Recreation Zone**

	North	Northwest	Central	West	East	South	Total
Total Water Surface (acres)	3,145	7,545	5,915	29,995	7,940	5,255	59,795
Navigable Water Surface (acres)	2,617	7,190	5,552	29,522	7,560	5,135	57,576
Navigable Surface Area (sq. miles)	4.1	11.2	8.7	46.1	11.8	8.0	89.9
Linear Miles of Navigable Waterways	61	58	132	152	122	110	635
Number of Marinas*	8	1	12	56	13	5	95
Boat Slips*	988	76	1,271	5,990	2,786	563	11,674
Water Features	Major channels provide linkages to other zones, city of Sacramento	Yolo Bypass: flood structure, shipping canal, and extensive tidal margin lands	Many navigable channels -- some circular -- the Delta Cross-Channel	Gateway to San Pablo and San Francisco Bays, many inundated islands	Numerous main river flows, channels, channel islands, sloughs, city of Stockton	Sheltered & quiet waters, Clifton Court Forebay, regulated water flows, many congested channels	
Typical Types of Recreation	Cruising, fishing, and channel exploring	Mostly land-based hunting and wildlife viewing	Cruising, fishing, water-skiing, camping, sailing	Wind-surfing, sailing, fishing	Fishing, sailing	Water-skiing, wake-boarding, fishing	
Unique Characteristics	Discovery Park, Old Sacramento, Stone Lakes Wildlife Preserve	Extensive natural and re-stored habitat areas	Consumnes River Preserve, Delta Meadows	Brannan Island, Bethel Island, Big Break Interpretive area	Mildred Island, several yacht clubs	Discovery Bay, many areas sheltered from wind by Diablo Range	

* See Appendix 5-2 for a detailed quantification of marinas and boat slips

NORTH ZONE

As shown in **Figure 2-3**, the North Zone encompasses the most northern reach of the Delta. It consists of the Sacramento River corridor from the city of Sacramento to the town of Courtland. It includes portions of Elk Slough and the northern extension of the Deep Water Shipping Canal, Lake Washington, and the Sacramento Water Lock. The estimated 2,617 acres of water surface in the zone translates to approximately 61 linear miles of navigable channels. The majority of these miles are in the Sacramento River corridor (31 miles), the Shipping Canal (9 miles), and Elk Slough (9 miles), with the remainder found along Steamboat Slough (12 miles). The inventory of recreation-related facilities in this zone includes approximately 20 facilities with eight located in Yolo County. The remaining facilities are in Sacramento County. There are eight marinas in this zone, providing a total of 988 boat slips.

Specific features that are unique in this zone include Discovery Park, (a Sacramento County regional water-oriented park), frontage along Old Town Sacramento, Raley Field (home of the River Cats, an AAA baseball team), upscale residential development in the Pocket Area, remnant fruit packing and shipping facilities along the Sacramento River, and the Stone Lakes Wildlife Preserve area. Much of the levee system along the Sacramento River and Elk Slough has “naturalized,” with stands of cottonwood, alder, valley oak, box elder, and willow providing a scenic edge for water-based views. The North Zone could be considered the Sacramento region’s gateway to the Delta. The stretch of the Sacramento River in this zone is an intensively used artery linking the lower Delta with the Old Sacramento vicinity and navigable waters upstream on the American and Sacramento Rivers.

NORTHWEST ZONE

As shown in **Figure 2-4**, the Northwest Zone includes the Yolo Bypass, Cache Slough, and portions of the Sacramento Deep Water Shipping Canal. The estimated 7,190 acres of water surface in this zone includes approximately 58 linear miles of navigable channels. The largest single block of these navigable miles is along the Shipping Canal

(18 miles). The remainder of navigable miles is found within the shallow waters along Cache Slough and the adjoining channels in the Cache Slough system. The Yolo Bypass is the dominant element in this zone, and it is notable for its primary function as a floodway. The Yolo Bypass provides peak-flow flood area for the Sacramento River during the high-flow periods, allowing the floodwater to flow directly to the lower Delta. The zone is notable for extensive natural and restored habitat areas, including segments of Cache Slough, Jepson Prairie, portions of Liberty and Prospect Islands, and the Vic Fazio Yolo Basin Wildlife area. This zone has relatively limited navigable waterways and minimal boating-related facilities. Drainages from Putah Creek, Willow Slough, and Haas Slough support additional natural habitat areas. The primary recreation uses in the Northwest Zone are waterfowl hunting and wildlife viewing, with some fishing at the southern end of the zone. Although there are several recreation-serving facilities in this zone, these facilities primarily serve land-based activities, including duck hunting and wildlife viewing. There is only one marina facility in the Northwest Zone. It provides 76 boat slips.

CENTRAL ZONE

As shown in **Figure 2-5**, the Central Zone encompasses the north central part of the Delta. It includes portions of the Sacramento River, Miner Slough, Steamboat Slough, Sutter’s Slough, Georgiana Slough, the north and south forks of the Mokelumne River, the Delta Cross Channel, Snodgrass and Lost Slough, and Beaver, Hog, and Sycamore Sloughs. The city of Rio Vista and the unincorporated communities of Courtland, Walnut Grove, Locke, Terminous, and Isleton are situated within this zone. To the east of this zone are the cities of Galt, Woodbridge, and Lodi. The estimated 5,552 acres of water surface in the Central Zone includes an extensive system of approximately 132 linear miles of navigable channels. The majority of these miles are along the Mokelumne River corridor (North and South – 36 miles), the Sacramento River corridor (23 miles), Steamboat Slough (13 miles), Georgiana (12 miles), and Snodgrass (9 miles). In some instances, as with the Georgiana Slough and North Mokelumne River, the waterways form circular loops for multi-route options. There are 12 marina facilities in this zone providing an estimated 1,271 boating slips. Additionally, there are numerous boating-associated facilities in this zone,

including boat-accessed restaurants, resorts, and yacht clubs. The Consumnes River Preserve, the McCormack Tract, and the Delta Meadows (a California Department of Parks and Recreation facility) offer some of the most attractive natural areas with designated anchorages. Walnut Grove has developed a public dock to enable access to the community. The primary recreation uses in the Central Zone include boat cruising, fishing, water-skiing, boat camping, and sailing. Much of the levee system in this zone has been engineered with stone or rock slope protection, thereby creating a sterile appearance for the waterside environment.

WEST ZONE

As shown in **Figure 2-6**, the West Zone encompasses the western limits of the Delta and serves as the gateway to the San Pablo and San Francisco Bays to the west. The West Zone includes the lower Sacramento and San Joaquin Rivers. The highest concentration of marina facilities is located in this zone, as well as the greatest number of boats on the water. The channels tend to be broad in this zone and contain the largest ratio of water surface area compared with land surface, especially towards the western limits of the zone. The estimated 29,522 acres of navigable water surface in this zone includes approximately 152 linear miles of navigable channels. To a large extent, these miles occur within the main flow of the Sacramento River (22 miles), the San Joaquin River (28 miles), and Old River (14 miles). There are also many waterway connector channels linking the larger water bodies. The cities of Pittsburg, Antioch, Oakley, Byron, and Brentwood adjoin the zone, while the unincorporated community of Bethel Island is located entirely within the zone. Besides the lower reaches of the Sacramento and San Joaquin Rivers, this zone includes Old River and Middle River, as well as numerous minor channels and sloughs. A unique feature of the West Zone is the many inundated islands that have expanded the extent of water area and, in some instances, the range of navigable areas. These inundated islands include, Franks Tract, Little Franks Tract, Lower Sherman Island, and Mildred Island. The extensive navigable waterways include many

channels sufficiently wide for larger boats and sailing vessels.

The West Zone offers unique microclimate conditions that enable some of the best year-round conditions for windsurfing, sail-boarding, and sailing. These same winds tend to limit the amount of water-skiing and wakeboarding in the area, since participants in these activities typically prefer calm conditions. Because the West Zone is the primary transition area between the saline Bay waters and the fresh Delta waters, it is known to attract an abundance and diversity of fish, including striped and black bass, sturgeon, salmon, bluegill, and crappie. Other unique features of this zone include State Parks Brannan Island Facility, Bethel Island (with the single highest concentration of boating-related facilities in the Delta), Lower Sherman Island (a Sacramento County water-access area), and the proposed Big Break Nature Center, with interpretive features developed through East Bay Regional Parks. There are 56 marina facilities in this zone, providing approximately 5,990 boat slips. Similar to the Central Zone, there are numerous boating-associated facilities in this zone. Also, like the Central Zone, the levee system in the West Zone has typically been engineered with stone or rock slope protection, creating a sterile appearance from the waterside environment. However, the typically broader expanses of water channels have the effect of reducing the visual impact of the engineered levees.

EAST ZONE

As shown in **Figure 2-7**, the East Zone makes up the southeastern portion of the Delta. Bordered by State Route 12 on the north, Interstate 5 on the east, State Route 4 on the south, and a north-south line from Route 4 to Route 12 on the west, the estimated 7,560 acres of water surface in the East Zone includes approximately 122 linear miles of navigable channels. The largest segments of these navigable miles are found along the main channel of the San Joaquin River (19 miles) and the Middle River (24 miles). The city of Stockton is the source for a significant number of users, as well as the economic hub that links agricultural, shipping, and recreation activities in the general vicinity. The San Joaquin River Shipping Canal traverses this zone from the northwest to the southeast. The Middle River also flows through this zone. Besides the main river flows, there are numerous channels and sloughs that define some of

the higher-elevation islands, and dead-end sloughs that generally run easterly along the eastern border of the zone. The East Zone is considered a superior shore fishing area with many accessible connecting and dead-ended sloughs. It includes a number of private yacht club facilities – typically situated on vegetated islands along the larger channels. Mildred Island, a submerged island adjoining Middle River, has characteristics similar to Franks Tract, with marginally navigable waters but apparently very good fishing conditions. There are 13 marina facilities in the East Zone, offering 2,786 boating slips.

SOUTH ZONE

As shown in **Figure 2-8**, the South Zone encompasses the southern extent of the Delta. This area is bordered by State Route 4 to the north, Interstate 5 to the east, the Southern Pacific Railroad easement on the west side, and Interstate 205 to the south. The estimated 5,135 navigable acres of water surface in the South Zone includes approximately 110 linear miles of navigable channels. The majority of these miles are along the main channel of the San Joaquin River (15 miles), Middle River (24 miles), Old River (42 miles), Victoria Slough (12 miles), Woodward Slough (4 miles), and the navigable portions of Discovery Bay. The Clifton Court Forebay, the California Water Project’s primary collection reservoir, is located in this zone. Discovery Bay, a water-oriented, residential development, is located off of Old River and east of the community of Brentwood. Situated on the lee side of the Diablo Range, this portion of the Delta tends to be the

most sheltered in terms of wind exposure. This area tends to attract boaters drawn to quieter waters and engaged in activities such as water-skiing and fishing. There are presently five marina facilities in the South Zone, with approximately 563 boat slips provided. Old River, portions of Middle River, and the main San Joaquin channel flow through this zone. Because of the intake facility near Clifton Court Forebay, water flows are heavily regulated in this part of the Delta. Also, many of the channels in this zone have become impassable due to snags and vegetation encroachment. There are fewer boating and water-associated facilities in this zone in comparison to the adjoining zones to the north. Urban pressures are significant in this zone, with both land-side and residential developments moving closer to the legal Delta Zone. The rapid population increases in residential pockets, such as Discovery Bay and the adjoining cities of Tracy, Byron, and Brentwood, suggests increased pressure on this part of the Delta for accommodating future recreation needs.

2.5 SUMMARY

The geographic and contextual characteristics of the Delta have a significant bearing on the range of water-based recreation presently occurring in the Delta. The value and quality of the resource will also continue to be important regarding considerations about future or potential recreation opportunities in the Delta. Each defined sub-area of the Delta offers unique opportunities and, in some instances, limitations for supporting water-based recreation activities. Also, there is a natural sorting that occurs with recreation activities matched against the conditions and resources available within the different Delta zones.